

To The Surgeon General U. S. A.

✓ With the author's compliments.

Formento (Felix)

SCHOOL HYGIENE.



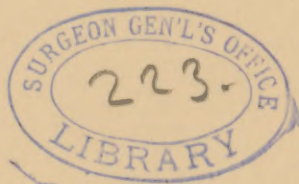
SCHOOL HYGIENE:

BY

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SCHOOL HYGIENE.

In the whole science of hygiene there is perhaps no more important subject than the study of childhood and its proper sanitary direction. In order to promote the welfare of society, we must begin by legislating for the benefit of the rising generation. Children to-day, men and citizens to-morrow, upon you will devolve the duties and responsibilities of government, the care and obligations of family. In your hands in a measure rest the destinies of a nation. That plant will yield the finest fruit which has received at the hands of the gardener the most assiduous care and intelligent cultivation. In a like manner intelligent hygiene will skillfully develop and transform weak and delicate children into strong, robust, and useful citizens.

Within the last few years legislators and hygienists have devoted time and labor to the study of the hygiene of children in all its aspects, and numerous laws have been passed for the improvement of their sanitary conditions. Earnest and philanthropic efforts have been made in that direction in every country. Real and unmistakable progress has been accomplished, yet much remains to be done. The mortality among young children is still frightful in many countries, and its main causes are the ignorance among the masses of the simplest notions of hygiene, and the numerous prejudices existing even among the higher classes. Societies for the protection of children—of more vital importance to the community than those established for the protection of animals—should exist in every city of America. They would spread among the masses such sanitary notions as would greatly diminish diseases and mortality of young children.

In some cities of France small tracts relating to the proper nursing of children are distributed free of charge to all persons registering the birth of a child. Why should not such a useful system be adopted in this country by our municipal authorities and boards of health? Those tracts have in many instances reached their twentieth edition, and been translated in all languages. These popular instructions have had excellent results in preventing premature deaths and accidents of different kinds: for instance, blindness from purulent ophthalmia in infants has become of late much less frequent than formerly.

It would be interesting to mention here the varied measures instituted within the last few years by the governments of Europe for the protec-

tion and development of children, especially in large cities. Among those measures is the enforcement of laws creating free public schools and making education compulsory. In England, France, Germany, and Italy, the common-school system has been extended to the smallest village. In all large cities are to be found public free schools, richly endowed, and offering every facility for a thorough and complete course of studies. The London public schools, for example, are admirably organized. The expenditures for its vast system of public education amount to a total of \$7,000,000 annually. More than 562,000 pupils attend these schools; the staff of teachers comprises 3,500 adult and 1,500 pupil teachers, or monitors. About 8,000 children have been fitted and sent from these schools to higher industrial schools. The appropriation for public education in England is about \$20,000,000 annually. There are 150 inspectors who visit schools throughout the kingdom: their salaries vary from \$2,000 to \$4,000 per year. In France, since the establishment of the republican government, immense progress has been made in the cause of public education. In 1882 the government's subsidy to the communes, in order to enable them to conform to the new law on compulsory non-sectarian education, amounted to the sum of 50,000,000 francs: the departments contributed 25,000,000 francs, and the communes 60,000,000, a total of 135,000,000 for primary education alone. In Italy great progress has also been accomplished. Public education is now made compulsory by law, and government, departments, and municipalities appropriate large sums of money annually for the extension and improvement of their public schools. The city of Turin, with a population of about 275,000 inhabitants, has spent within the last three years the sum of 3,000,000 francs for the improvement of its public schools.

In our country, under the enlightened influence of republican institutions, the people have long been able to appreciate the benefit of general public education, and our system of schools has been studied and adopted by every civilized country. A majority of our states have adopted laws making free education compulsory.

According to the census of 1880 there are in the United States not less than 9,800,000 children enrolled in public schools, with about 282,000 teachers, more than half of whom are ladies. The expenditure for public schools amounted during that year to nearly \$80,000,000. As is well known, in our country provision for popular education is left to the exclusive control of states. The proposed plan of national aid to the several states, for the purpose of promoting public education according to the needs of the respective states, has not apparently met with popular favor. This year there are not less than 300,000 children attending the public schools of New York city, an increase of 10,000 over last year. Besides the elements of a good English education, they receive free instruction in music, drawing, French, or German. Both sexes, with an exception or two, follow the same course of study. The expenditure for these schools is put down at \$4,500,000 a year. There are 4,000 teachers, the great majority of whom are ladies. The highest salary paid to a

man is \$3,000; to a woman \$1,900. The new compulsory education law requires fourteen weeks' schooling in the year for every child in the city.

More than ever of late this subject of education has absorbed the public mind, and notable progress has been accomplished in every part of our country, extending to the remotest section of the South. Everywhere schools have been established. Even among our colored population the benefit of free education is being gradually felt. But of what avail would schools be without school hygiene?

School hygiene is the study of those sanitary conditions which impress their mark and influence, for evil or for good, over the whole organism and future life of the child. Is it not as necessary to teach to our children the road that leads to health, as that which leads to fortune? The latter will often depend upon the former, whilst without health riches are of no value, and life has no charm.

Modern education should cultivate physical as well as mental development. They should accompany each other, or, rather, the physical should precede the mental development, for, without a proper physical basis or foundation, the premature and isolated culture of intellect would soon be followed by organic waste and exhaustion. *Mens sana in corpore sano* should be the aim of a correct and philosophical system of education.

The ignorance or neglect of hygienic laws relating to the school-life of children is the cause of many physical lesions or infirmities which are in a great measure preventable. Incorrect and awkward sitting postures, for instance, kept up for many hours daily on badly constructed benches, not adapted to the size and age of the scholar, will give rise to vicious attitudes, to deviation of the vertebral column, to cardio-pulmonary trouble; close confinement in crowded and badly ventilated rooms will produce chlorosis, anæmia, and all their results; improper light, the use of badly printed books, will produce defective accommodation of the eye-globe and myopia; excessive studies, without any regard to the age and personal aptitude of scholars, the system of cramming, so generally followed nowadays, will bring on cerebral excitement, nervous susceptibility, predisposition to neurosis,—the disease of the day,—and, finally, cerebral inertia and impairment of intellectual functions. All these baneful consequences can be avoided by a proper physical and mental school programme, adapted to the age and intellectual capacity of the child, and fulfilling the *desiderata* of hygiene.

SCHOOL-HOUSE—ITS SANITARY CONDITIONS; MODE OF HEATING, LIGHTING, VENTILATION; ITS FURNITURE, ETC.

A school-house should be, as far as practicable, centrally located, of easy access, well ventilated, properly heated, and removed from all noisy, unhealthy, or immoral neighborhoods,—far from cemeteries, factories, places of amusement, unsanitary establishments, and nuisances of all kinds.

Its superficial area should be calculated at 10 yards per scholar. In no case should it be less than 500 yards. Its exposition should be determined by the climate and sanitary conditions of the locality. There should be distinct departments for boys and girls. The school-house yard should be large, airy, clean, dry, and well drained. A proper shed is useful for rainy days, and during the hot days of summer. Roads leading to the school should be kept in good order, to avoid both dust and mud. The maximum number of scholars to each class-room should be 50, if there is but one class-room, and 40 if more than one. Each scholar should be entitled to not less than 1^m 25^c surface room, and 5 cubic metres of air. The rooms should be rectangular, the ceilings high. These, as well as the walls, should be smooth, without cornices or ornaments. The windows should be high and wide, and so disposed as to secure perfect ventilation. The proportion of window space should equal 40 to 50 per cent. of the floor space.

Unilateral light should always be preferred when practicable. When bilateral, it should be stronger on the left than on the right side. The light should not be too intense, as it increases the heat in summer, fatigues the eyes, and gives rise to dizziness and headache. It should be moderated by the proper use of awnings and window-shades. The walls should be unpapered, and, when practicable, covered with stucco, or plaster painted in oil colors. Miasmata and dust do not stick to oil or stucco surfaces, which can be easily washed. The color of ceilings and walls is by no means indifferent. White walls are unfavorable and irritating to the eyes, especially with lymphatic and scrofulous subjects. The most desirable color would be a light green or light blue above, with darker shades below.

The floorings should be cemented, or made of hard wood and well polished. Spitting on the floor or wall should be strictly prohibited. Besides being unclean and unrefined, this habit may have pernicious results. Since the discovery of the *bacillus* of phthisis, it is natural to believe that sputa may transmit the disease by the diffusion of the *bacilli* in the atmosphere. Sore throats and diphtheria may very likely be transmitted in the same manner. Has it not been shown that the secretions of certain contagious diseases do not lose their virulence even after having been dried, offering a certain analogy with the blood of animals dying of splenic fever, which blood may be dried and kept for years, and pulverized into dust, and yet contain living germs capable of reproducing the infectious disease?

Spittoons containing proper disinfectants,—solution of sulphate of iron, or chloride zinc,—should be used in all school-rooms; and, besides, the bad habit of spitting, so common in some parts of our country, should be discouraged as far as possible. It has been said that in Berlin the school-room discipline is so severe as even to forbid coughing. If such be the case,—no doubt, in the majority of cases, a strong effort of volition will prevent coughing,—it ought to be easier to prevent spitting.

Great attention is required for the proper ventilation of the school-

rooms, especially during the winter. Impure air should be constantly renewed by currents of pure heated air. In the coldest days renewal of impure air should be secured without exposing children to draughts. As a rule, school-rooms are too much heated. A temperature of $+15^{\circ}$ centig. is quite sufficient. Heating by means of steam or gas is to be preferred to any other. The first cost of fixtures, which is rather expensive, will be greatly compensated by the economy of combustible, its cleanliness and its facility of maintenance. When furnaces are used, proper precautions should be taken for the constant renewal of pure air.

Special attention should be paid to the construction of water-closets and urinals. In schools, as well as in soldiers' barracks, they often become active foci of disease. Cholera, typhoid fever, dysentery, diphtheria, and other diseases of a contagious or infectious character, are often propagated and spread by means of defective water-closets. A single individual, in a school or soldiers' barracks, may be the means of developing a violent epidemic. At times, a student in the premonitory symptoms of typhoid fever, having only a slight diarrhœa, is taken with fever, and goes home, after having introduced the germs of the disease in the school closet. At other times, a convalescent of typhoid fever reënters school, bringing along with him the disease germs. Dr. Budd, of Bristol, has noticed three epidemics of typhoid fever in schools by the return of convalescing scholars having only a slight diarrhœa. The same has been observed in military barracks. Certain epidemics of diphtheria have been traced by investigation to the deplorable condition of water-closets.

Modern researches on the infectious nephritis of typhoid fever and diphtheria, with corresponding alteration of urine, compel us to consider urinals almost as dangerous, in some cases, as closets, and requiring the same precautions.

The possibility of transmission of certain diseases, such as dysentery, scarlet fever, diphtheria, measles, etc., for a certain period of time after the subsidence of all symptoms, is a well known fact; and strict rules should be enforced, fixing the number of days that should elapse in each case between convalescence and the return to school. That number of days should vary from twenty to forty; and all children affected with any of the above named diseases should take several baths, and undergo disinfection at home, before returning.

A sufficient number of urinals and closets should be established for each school—not less than four for one hundred scholars. They should be properly constructed, and always kept clean, ventilated, and thoroughly disinfected. When water-closets proper cannot be introduced, *earth closets*, often renewed, should be preferred to permanent vaults.

School furniture, benches, seats, and desks should occupy our attention for an instant. This subject is of great importance, if we should judge from the numerous varieties of school furniture proposed in every country. It has been calculated that, at the rate of forty weeks schooling per year, children spend during the beautiful years of their youth, when

physical development is most necessary, not less than 12,360 hours on school benches, without counting hours of study at home! With imperfect seats and desks, these prolonged sitting postures may and do give rise to very serious consequences, the least of which are faulty attitudes, deformities of spine, and myopia. Tables formerly used, with benches attached to them, for four, six, and eight scholars, are bad, as children cannot be so easily watched, and because the whole bench is disturbed every time a scholar in the centre wishes to come in or go out. New models of combined chairs and desks, for two children, are greatly to be preferred. They should be graded, in four or five numbers, according to the size of children. They should have a back and a foot-rest. The seats should be sufficiently wide, and so constructed as to support not only the pelvis, but part of the thigh. The lid of the desks should be movable, and present an inclined plane, better suited for reading and writing with ease and comfort. Hat-racks should not be used indiscriminately for a number of scholars. They are frequently the means of transmitting parasitic affections. Each child should have a separate hat-rack, or a simple polished nail, for his own exclusive use, with his name over it. It would be a good rule to require all boys to have their hair closely cut, and all children affected with parasitic diseases should be immediately removed from the school-room. Solidity, simplicity, and cheapness are among the first requisites of school furniture.

Proper attitude of scholars while sitting at their desks should be strictly enjoined, and in order to obtain it constant surveillance is required from teachers. Children should not be allowed to lean forward on their desks, to bend or twist sidewise their bodies, to have their noses in their books whilst reading or writing: it has been noticed that they lean forward in writing much more than in reading. The scholar should sit squarely on both ischion, the shoulder line should be horizontal and parallel to the margin of the desk or table, the vertebral column well erect, the book or paper held at least twelve inches from the eyes. Elbows should not rest on the table: resting both elbows at the same time is less objectionable than one. In writing, the paper should be kept in position with the left hand.

George Sand once gave a very simple and excellent formula for preventing scoliosis and myopia, viz., "*Ecriture droite sur papier droit, corps droit.*" The idea of substituting vertical for inclined handwriting, now so much in vogue, may at first blush seem singular, but undoubtedly the above prescribed posture, with the body in perfect symmetry, erect and parallel with the table, the paper well kept in front, seems to avoid all lateral deformities and myopia. It maintains the head in its normal position, and prevents its tendency to fall nearer and nearer the paper.

We notice less myopia in country schools than in city schools. It is probably due to better hygienic conditions and more regular habits, among which are early rising and early going to bed. For the same reasons myopia is quite rare among primitive races and among our colored population. City children are less disposed to wear spectacles than country

children: they pretend to conceal their infirmity and fatigue their sight by great efforts of accommodation, thereby increasing myopia. The latter is frequently the result of badly printed books. These require special attention. They should be, so far as practicable, of uniform type, not too small, and *interlined*. Through a faulty system of economy, school-books with fine type and *not* interlined are often used. Nothing is more fatiguing to the sight than absence of interlines: all printers agree on that point. Small type interlined is less objectionable than larger type not interlined. For school books each line should have a minimum height of three and one half millimetres.

Badly printed books and faulty attitudes while sitting, together with long hours of study without proper intermissions, and poor light, are the principal causes of myopia. They bring on, especially in young children, in whom the tissues are lax and easily distended, those physical changes in the eye-ball upon which myopia depends.

In so far as the sight is concerned, no inconvenience has been noted from the use of slates, which are rather out of fashion. The disadvantages of the use of slates are the noise made by the slate pencils, unclean hands, and a certain degree of stiffness of fingers, especially when using the pen after the prolonged use of the slate.

CALISTHENICS.

Calisthenics or gymnastics are now introduced in most private institutions. It is a great progress, and in our opinion the practice of such useful hygienic measure should be made compulsory in all our public schools for both boys and girls. It is as important for the latter as for the former. It is not necessary to have complicated and expensive apparatus. A few horizontal bars, a few rings and weights attached to cords and pulleys, will be sufficient. The object of school gymnastics is not to make acrobats of children, but to develop their muscles, to strengthen and equilibrate their nervous system. By its use the child will acquire presence of mind and self-reliance in face of danger.

As far as practicable, gymnastic exercises should take place in the open air, or in a well ventilated and lighted room. Proper instruction should be given in regard to breathing during exercises, and to deportment in walking, sitting, and standing. A useful system of calisthenics without apparatus, for young children, should consist in varied motions of head, trunk, and limbs, in running, jumping, swimming motions, &c. Stick exercises, which are quite varied, as well as ladder exercises, should be added for older children.

A well understood system of gymnastics is one of the most powerful means of diminishing nervous susceptibility, tendency to chlorosis, chorea, phthisis, and scrofulous affections. Such exercises should not be continued beyond a short period—twenty minutes—and should never produce fatigue or exhaustion.

STUDY OF HYGIENE IN SCHOOLS.

A reform of the highest importance, which should be adopted in all our schools, is the teaching to children of elementary notions of hygiene. In several of our states, as far back as 1850, Massachusetts taking the lead, strong efforts have been made to introduce the teaching of hygiene and physiology in the public schools. Unfortunately, with few exceptions, these efforts have not been successful, and there are but very few schools in which hygiene is taught, even in its most elementary form. In fact, strange but true, few of our medical schools possess a chair of hygiene. From recent statistics, we notice that in eleven states only are elementary notions of hygiene given in a few primary or high schools. Amherst college, Mass., is perhaps the only college in which a complete and thorough course of hygiene is given. In my own state, a recent attempt made by our educational and medical societies to obtain from the legislature the enactment of a law requiring the teaching of physiology and hygiene in the public schools has been ignominiously defeated.

Yet hygiene is perhaps the most useful of all sciences. Millions of men, women, and children, all over the world, live in most deplorable hygienic conditions, and ignorance of sanitary laws still prevails to an alarming degree. Sanitary regulations are looked upon as absurd and tyrannical, on account of popular ignorance and prejudice. Is there a more rational means of enlightening the people, of uprooting erroneous ideas and dangerous prejudices, than by generalizing through the public schools simple and correct ideas of hygiene? Public lectures and papers on the subject are not sufficient: they only reach a certain class of people. The teaching of this science in public schools will eventually introduce among the masses true and precise ideas in regard to health, its immense value to individuals as well as to governments, and to the best manner of promoting it, and of avoiding disease and premature death. Through school children those ideas will reach the family, and gradually the whole community. The knowledge of hygiene and sanitary laws should not be the exclusive privilege of scientists. How many evils, physical and moral, might be avoided by a more general diffusion of the principles of hygiene! The latter does not only tend to promote and secure health, but is also one of the great factors of morality and wealth. There can be no true civilization without hygiene. It should be taught in primary schools in a concise, clear, and attractive manner, adapted to the age and intelligence of the child, and limited to elementary and essential principles: in higher schools its study could be made more complete and thorough. This study is of equal importance to both sexes, and should therefore be taught in both boys' and girls' schools. Elementary lectures on anatomy and physiology should always precede. Without some notions of those branches, so important and useful by themselves, the teaching of hygiene, based in a measure upon them, would necessarily

be incomplete and unsatisfactory. The teaching of anatomy, physiology, and hygiene should always, in preference, be entrusted to a medical man. But there exist in our country so many excellent books on the subject, that the teaching of those sciences, in public schools, by persons outside of the medical profession, will be greatly facilitated. Among the books most suitable for children under twelve years of age, we should mention Jarvis's *Elements of Physiology and Health*, Cutter's *First Book of Anatomy, Physiology, and Hygiene*, and Foster's *Primer*. For older and more advanced youths we should recommend Comings, Cutter (*New Analytic*), Dunglison, and Hutchinson. Dalton, Draper, and Youman's *Huxley* are excellent for the higher classes and adult students.

SCHOOL MEDICAL INSPECTION.

In order to secure proper school hygiene and to enforce sanitary regulations such as we have suggested, every school, private or public, should be the object of a special sanitary inspection. This inspection should be entrusted to competent and reliable medical men, appointed and paid either by school boards or by city or county authorities. To be effective, this inspection should be complete and made at least twice a month in every school of the locality.

We have seen that schools can exercise bad influences on the health of children. It is therefore necessary that these influences should be detected and corrected as soon as possible. School medical inspectors should advise school-boards and teachers in all questions pertaining to the hygiene of the school-house and scholars. Their surveillance should be limited to a certain fixed number of schools and children. Plans for school-buildings should be submitted to the medical inspector in order to secure all hygienic requirements.

The inspector should pay special and constant attention to the size, sight, and hearing of children, so as to advise intelligently on the proper seat and desk suitable to each child, his position in the school-room in regard to light, distance from black-boards, &c. Near-sighted children, or those who have a tendency to myopia, should naturally be *placed* so as to avoid great efforts of accommodation liable to produce or increase this affection. He should also pay attention to the number of scholars in each class, visiting them during school hours, to their manner of sitting at the desk, to the character or type of books, to the proper temperature and ventilation of the room, &c.

The medical inspector should have an advisory voice in the adoption of a proper programme of studies. He should see that all children are properly vaccinated; that all contagious diseases are carefully excluded from the school until there be no further danger of contamination; that water-closets, back yards, alleys, &c., are properly cleaned and disinfected at frequent intervals.

All notes and observations made by the inspector during his visits should be accurately kept in an appropriate register for the inspection of

the proper authorities. A monthly report should be made by him on the sanitary conditions of the schools and school children in his district, on the diseases occurring among the latter, with particular reference to contagious and infectious diseases.

In some cities of Belgium, which, by the way, possesses a most excellent public school system, the inspector is even authorized to prescribe and furnish, free of charge, to poor and delicate children, such tonics as cod liver oil, iron, etc., as their condition may require. The results obtained from this humane practice have been most satisfactory. Why should not such a philanthropic and enlightened measure be adopted in our own country?

SCHOOL PROGRAMME OF STUDIES.

We now come to the last, and perhaps the most important, part of our subject, viz.: In what consists a proper programme of studies, suitable to the age and intellectual capacity of children, and in conformity with the laws of hygiene?

Every physician, physiologist, or hygienist, who will take the trouble to examine the curriculum of studies generally followed in primary schools, will soon be convinced that it has not been established in accordance with that gradation required by the physiological development of brain. As a rule, the programme of studies is too complicated and comprises too many different subjects, school-hours are too long and too continued without sufficient intermissions, and the method of teaching is too abstract.

Children cannot concentrate for any length of time their attention on one subject. The only way of not fatiguing it is to have short lessons and short explanations. Independently of individual aptitudes, which should be taken into consideration, the number of hours given to study should vary according to the age of scholars and the season of the year. It is evident that the same number of hours devoted to intellectual labor should not be imposed on children seven or eight years old as on those of twelve and fourteen. Yet we often see the same number of hours adopted for the whole school. It is hardly necessary to mention that during the summer months, especially in our Southern country, the intellect is less capable of steady and profitable application than in winter. Heat depresses, whilst cold invigorates, mind and body.

Infancy is the age of *sensations*. Everything for a child is an object of curiosity. The rapid developing of his nervous system is still increased by the thousand objects which strike his senses. His curiosity is wide awake, his muscles always in motion. The impressibility of his cerebrum is such that at times very slight causes will determine delirium and convulsions. Reflex actions are varied, frequent, and rapid, on account of the instantaneousness of his impressions.

One of the first conditions of a correct primary education is to avoid increasing this excessive nervous sensibility by a premature exercise of

the cerebral functions. The prevailing faculty of young children is memory. Later on, reasoning and judgment will develop. During the first period of intellectual life, concrete ideas, objects, can alone captivate the mind, which, at that period, cannot yet grasp abstract notions. Young children have extraordinary facility for languages, which they learn by hearing and speaking, without any idea of grammatical construction. Later on, they will understand rules of grammar and the orthography of words. We have all known some young children who could speak with equal facility three and four languages. This variety of language is an excellent gymnastic exercise for the organs of articulation. It is the means of acquiring perfect flexibility of tongue and a correct and pure pronunciation, which it is impossible to acquire in later years.

We have noticed that children are incapable of long and steady attention. Cerebral lassitude soon supervenes, with impaired perception, diminished memory, headache, vertigo, &c. Hence the necessity of frequently changing the subjects of study, and of short intermissions between classes or lectures. These, when practicable, should be given in different rooms, thus affording to the children an opportunity for motion, or slight exercise and renewal of air. This system is followed with excellent results at the high school of the academical department of the Louisiana University.

This cerebral lassitude in school children has been demonstrated in a striking manner by the interesting experiments of Dr. Sikorsky, of St. Petersburg. He selected a very easy task—*dictation*. Twice a day he dictated to his scholars from the same book, once in the early morning at the opening of the school, and, later on, during the day, after four or five hours of studies. This was repeated in a number of schools. Out of a total of 1,500 dictations of the same character, representing about 40,000 words, examined by him, Dr. Sikorsky found that the afternoon dictations were from 25 to 50 per cent. inferior, in every respect, to those written in the morning. Such a difference is the result of the impairment of cerebral faculties by continuous application.

The number of school hours varies from twenty to thirty per week in England, twenty-eight to thirty-two in Germany, and from forty to forty-eight in France. To these must be added several hours a day for study and exercises at home after school hours. In Belgium they have adopted, we think, the best system. The number of hours varies according to the age of the scholar. Children from six to eight years of age have twenty-five hours' study per week, and those from eight to twelve years have thirty hours' study. This includes gymnastics, drawing, and singing, and needle-work for girls. In Belgium, school regulations have abolished study and exercises at home for young children, and limited them to a few hours for older ones, say from ten to fourteen years of age. These home exercises may have the inconvenience of keeping the child in an atmosphere often impure, in crowded rooms, and on badly constructed seats, thereby favoring awkward and vicious attitudes, &c. On the

other hand, they accustom the child to rely upon his personal efforts, and develop his individuality.

One of the first conditions and most important factors to prevent cerebral lassitude is sleep. Important at all ages, it is particularly so in childhood. The advantages of sleep, "sweet restorer," cannot be over-estimated. Leaving out individual differences, due to special idiosyncrasies or constitutions, children between the age of six and ten years should have a sound sleep of at least ten hours; those between ten and fourteen years should sleep nine hours at least. In addition to sleep, recreation, exercises of the body, gymnastics, excursions in the country, etc., should be prescribed in order to maintain the equilibrium between physical and intellectual development.

Recess should last an hour, and should take place in the middle of the classes, thus forming two sessions of studies daily. The teacher should see that children take time to eat their lunch. Some arrangement might be made to furnish them with a hot meal in very cold weather.

Music and drawing, which held a high rank in the education of Greek and Roman children, should be encouraged in our schools. Besides being great accomplishments, they are excellent gymnastic exercises for the ear and eye. These arts are not for the scholar an increase of work, but a source of pleasure. Singing favors the development of lungs and chest: it perfects the voice, cultivates taste, and gives great delicacy to the ear. Reading aloud has also useful results. Drawing forms the taste, develops delicacy of hand and touch, and inspires the love of the beautiful. Both singing and drawing should be begun in an early age.

For the benefit of both scholars and teachers, there should be at least two months' vacation during the hot season of the year, in addition to the usual two days of rest a week. Vacations should be utilized for a few hours' study or reading per week, combined with promenades and excursions. They should be spent in the country whenever practicable.

The main object of education is not simply to teach words and names, but rather ideas and things; to learn how to think and reason, to inculcate in the child's mind just notions, exercise his intelligence on objects which strike his senses, and to enlighten his conscience, while simultaneously striving towards the harmonious development of all his organs.

Religious ideas appertain more properly to church and family than to the school-house. But without entering into questions of dogma, the educator will find occasion to recall to the minds of the students the thought of God, the wonders of creation, and those great moral virtues which are common to all religions and to all civilized nations.

What the child needs above all is good, pure, moral surroundings at home and at school, good examples from parents and teachers. Actions, not words, should teach morality. The reading of heroic deeds, the contemplation of the marvellous spectacle of Nature, should inflame the child's heart with sentiments of pure moral enthusiasm.

The mission of the teacher is a noble one indeed. Whilst engaged in giving his pupils an hygienic training, he should, at the same time, not

neglect their moral education. In every daily occurrence he can intelligently find a theme for a moral lesson. A lecture, a friendly conversation, an excursion in the country, will be as many occasions to him to inculcate in the heart of his pupils good and honorable sentiments, the love of truth and justice, and the ambition of being truly a man.

With your permission, I will now lay before you a programme of studies for school children, which, I think, fulfils at least the principal desiderata of hygiene. It is, with a few alterations, somewhat similar to the programme adopted in Belgium.

TABLEAU OF SCHOOL STUDIES, INDICATING THE NUMBER OF HOURS PER WEEK DEVOTED TO EACH BRANCH OF STUDY.

BRANCHES OF STUDY.	Age, 7 and 8 years.		Age, 9 and 10 years.		Age, 11 and 12 years.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Mother tongue	5 hrs.	5 hrs.	9 hrs.	8 hrs.	10 hrs.	9 hrs.
Writing	3	3	3	3	3	3
History and geography	1	1	2	2	2	2
Hygiene and physiology	1	1	2	2	2	2
Natural sciences	1		1	1	2	2
Arithmetic	3	2	3	2	3	2
One foreign language	3	3	3	3	3	3
Drawing	1	1	1	1	1	1
Singing	1	1	1	1	1	1
Needle-work		2		2		2
Gymnaastics—recreation	5	5	5	5	5	5
Total hours per week five days	24	24	30	30	32	32

Thanking you for your kind attention, I beg leave, gentlemen, to here express the hope that such a programme, or an approximating one, will receive the valuable endorsement of this learned assembly, and will soon be generally adopted in all the public schools of our country.

